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ABSTRACT

This paper offers a theoretical rationale for the use of technology--and particularly interactive electronic media, such as graphics-enabled word-processing programs, "talking books," e-mail, computer-assisted writing programs, and the World Wide Web--in the classroom. The rationale focuses on two aspects of literacy development: the ability to consider multiple symbolic perspectives in the process of making meaning and the ability to reflect on language. The tool of technology enables children to work with multiple sign systems simultaneously, thereby providing opportunities for them to reflect on language while constructing meaning from multiple perspectives in the social context of the classroom. How this resource is used affects literacy development in a multitude of ways. These theoretical constructs provide a foundation for suggestions for practice, presented in a series of classroom scenarios. (Contains 27 references.) (Author/NKA)

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Dancing on the Keyboard: A Theoretical Basis for the Use of Computers in the Classroom.

by Maureen Carroll

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Dancing on the Keyboard

A Theoretical Basis for the Use of Computers in the Classroom

Maureen Carroll

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Abstract

This article offers a theoretical rationale for the use of technology -- and particularly interactive electronic media -- in the classroom. The rationale focuses on two aspects of literacy development: the ability to consider multiple symbolic perspectives in the process of making meaning, and the ability to reflect on language. The tool of technology enables children to work with multiple sign systems simultaneously, thereby providing opportunities for them to reflect on language while constructing meaning from multiple perspectives in the social context of the classroom. How this resource is used affects literacy development in a multitude of ways. These theoretical constructs provide a foundation for suggestions for practice, presented in a series of classroom scenarios.

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> Samantha is sitting at the computer, reading a story about a camping trip on the screen. With this particular software, when a child comes to a word that she does not know, she can click on it with the computer's mouse and hear it read aloud. Samantha frowns at a picture of a fierce-looking bear hovering near the tents at the campsite, and when she clicks on it she hears a noisy growl. She then reads aloud the words that appear on the monitor: "The bear quietly ran away." The text, however, actually says, "The bear quickly ran away."
>
> Samantha could have used the audio feature to help her read the sentence correctly, but she didn't know that she had misread "quickly" and she therefore had no reason to make use of this capability of the software. In this regard, then, the computer will not teach Samantha how to read; instead, it merely has the potential to help her gain information about how language works -- a potential that probably cannot be realized if she works alone in front of the computer, in isolation from the larger social context of the classroom.

This vignette illustrates the importance of viewing classroom technology as only one tool among many that can be used to facilitate children's growth as meaning makers. The presence of computers in the classroom does not guarantee that children will make use of them in ways that foster their development as literacy learners.

In the first part of this article I offer a theoretical rationale for the use of technology in the classroom that focuses on two important aspects of literacy acquisition: the ability to consider

multiple symbolic representations in the construction of meaning, and the ability to reflect on language. In the second part I illustrate how these theoretical principles might be enacted in the social context of the classroom, in order for children like Samantha to use the tool of technology to empower their learning. For the purposes of this article, I focus on one component of classroom technology: interactive electronic media such as graphics-enabled word-processing programs, "talking books," e-mail, computer-assisted writing programs, and the World Wide Web, all of which allow the user to pursue multimedia representations -- such as images, sounds, or intertextual links -- in a nonlinear fashion.

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Theoretical Framework

In order to explore more fully the role of classroom technology in a child's meaning-construction process, I have situated this discussion within a social-constructivist perspective of learning. Even in the period of "emergent literacy," the very earliest stages of literacy development, young children's literacy concepts are not mere approximations of those of literate adults (Clay, 1966, 1967; Sulzby, 1985; Teale, 1987). Instead, early reading and writing concepts, behaviors, and attitudes are constructed as the child participates in a social environment.

Shulman and Carey (1984) describe social constructivism as a way of viewing the construction of meaning through the reciprocal influence and interaction of individual and context. During social exchanges within specific settings, individuals acquire the skills, knowledge, and dispositions that enable them to participate in their group or society. As a theory of cognitive development, social constructivism shifts us away from thinking about individuals who construct their own meanings through interaction within their environment to a view of a collectively constructed meaning. Language is central to this view, since human social activity reflects the role of speech to communicate and engage in dialogue with others (Bakhtin, 1986).

This social-constructivist perspective, then, underlies this article's discussion of two roles of classroom technology:

- providing opportunities for children to consider multiple symbolic perspectives in the meaning-construction process, and
- providing opportunities for children to reflect on language.

Although these roles are considered separately, it is critically important to emphasize the connection between them. In my view, this connection can best be illuminated by thinking of each of them as coming into view and fading out, as one might see on a computer or movie screen, in a sequence so quick that it is difficult to tell when one ends and the other begins.

Multiple Symbolic Representations

As children learn to use language and to read and write, they are essentially making use of multiple sign systems in their quest to make sense of their worlds. Berghoff (1993) describes the concept of "aesthetic literacy," a holistic understanding of literacy acquisition

that comprises multiple systems of expression. She suggests that cultural beliefs and social conventions organize and regulate our use of symbols within these different systems, which Eisner (1978) discusses as follows:

> Each symbol system -- mathematics, the sciences, art, music, literature, poetry, and the like -- allows us not only to conceptualize our ideas about reality but also to convey those ideas to others. Each symbol system sets parameters upon what we can conceive and what we can express. Thus, through painting we are able to know autumn in ways that only the visual arts make possible. Through poetry we can know autumn in ways that only poems can provide. Through botany we are able to know autumn in ways that only botanists can convey. How autumn is conceived and hence, what we know about it, depends upon the symbol system we use or choose to use.

Classroom technology and multiple sign systems. The ability to construct meaning from multiple symbolic representations is an important part of literacy development. In the social context of the classroom, children can use technology to access multidimensional texts (e.g., multimedia CD-ROMs, interactive software programs, or websites), from which they discover that signs and symbols take different forms and convey different meanings. They learn how to use different sign systems, and how to "transmediate" content and expression from one system to another (Eco, 1976; Peirce, 1933, 1935).

Semiotics, the study of signs and sign systems, looks closely at the underlying processes involved in making meaning. It involves the analysis of how individuals within particular cultural contexts produce meaningful symbols, use them to communicate, interpret them, and organize them systematically into codes vital to social interaction (Eco, 1990; Gillan, 1982). Taking a semiotic perspective about literacy helps us extend out thinking beyond conventional texts to include multimedia computer-based compositions.

Labbo (1996), for example, looked at the way young children made and used symbols with KidPix 2 computer software (Broderbund Software; now available from The Learning Company). With this program, both drawing and word-processing tools are available. Labbo found that in using the software, children employed referential symbolism (labeling symbols with real-world referents), conceptual symbolism (labeling symbols as part of a conceptual class of objects), functional symbolism (using symbols in culturally identifiable ways, such as choosing a symbol of a chair and saying, "People use furniture to sit on"), and constructive symbolism (grouping symbols to make more complex objects). This study clearly illustrates the complex ways children use symbolism in the meaning-construction process, and how a cycle of cognitive work can be facilitated through the use of the computer.

Classroom technology can also be used to support the construction of meaning from multiple symbolic perspectives in children's writing. Dyson (1989) developed a theoretical framework that views writing as "evolving within and shaped by children's interactions with other symbolic media and other people, including their peers." She also states that for children to develop as writers -- particularly as writers of imaginary worlds -- their written

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texts must become progressively more embedded in their social, affective, and intellectual lives. Creation of imaginary worlds provides a means for children to explore ways to move within their own "real" worlds while at the same time experimenting with social interaction.

Classroom technology may enhance children's ability to move across and between symbol systems. Further, by allowing the child to access a diverse range of multidimensional text worlds, technology can provide a rich means within which to engage in imaginative play and expression. Examples of such technology include multimedia encyclopedias on CD-ROM, numerous software programs (a review site such as SuperKids can provide descriptions), websites such as The Odyssey: World Trek for Service and Education, and e-mail.

Kinzer and Leu (1997) found that multimedia environments provided a powerful means of storing, revising, and presenting work over time. The students in their study, part of the Young Children's Literacy Project, constructed Internet home pages, read stories and wrote their own related ones, published them, and put them online in *The Little Planet Times* to be accessed by others. They added music and illustrations in their stories, thus working across multiple symbolic forms of expression.

Illustration, in fact, plays a central role in children's early literacy efforts. As very young children draw and scribble, they learn about the visual qualities of objects and the graphic properties of line, color, and shape (Smith, 1979). They also explore the creativity involved in expressing meaning.

Chia and Duthie (1994) studied children in a computer-based art program, working from the view that "computers are making unprecedented aesthetic experiences possible and revolutionizing the way art is conceived, created, perceived and taught." Children in the study explored spatial relationships, compositional elements, and the technological capabilities of the software as they doodled on screen, using computers to support their creative experiments. They developed an awareness of artistic elements such as line, shape, color, perspective, and proportion. The Internet also provides resources where children can experiment with and explore artisitic expression, at sites such as Global Children's Art Gallery and The @rt Room.

Challenges. There is obvious value in guiding children to move among multiple sign systems and providing them with opportunities to experiment in doing so, but the tool of classroom technology itself will not foster the ability to consider multiple perspectives in the process of constructing meaning. What if, for example, the computer interferes with aesthetic expression? Using a mouse is removed from the tactile experience of drawing with crayons or painting with fingerpaints. It may allow a child to draw more sophisticated pictures, have neater writing, or import images from afar for inclusion in a story. Does having access to more finished products change the child's creative process?

Further, if our developing writers have access to new and sophisticated tools to express

meaning in ways that cannot be done without a computer, their very conception of what writing is may change. But what if children do see this type of symbolic representation as simply normal? Are they not just using the tools available in their culture to make meaning? And isn't using the available tools a sensible and useful strategy in meaning making?

The use of classroom technology alters children's experience of artistic and written expression in that it allows them to create new types of work that would not be possible with conventional tools. As Reinking (1994) points out with regard to creating webpages and websites, "hypertexts remind us that acquiring the discipline to organize one's thoughts into a linear hierarchical argument is a large part of what we call being literate only because the technology of print does not invite other ways to structure an argument, not because that is the natural way we think." This is important to remember as we situate technology in particular classrooms, to be used by particular children in particular situations. As computers become ever-more prevalent in today's classrooms, it is vitally important that we consider how classroom technology may both support and constrain literacy development while changing our very definition of the nature of reading and writing.

Reflecting on Language

The second area of literacy development to be considered is the ability to reflect on language. Tunmer and Bowey (1984) describe this "metalinguistic awareness" at four levels: phonemic awareness, word awareness, form awareness, and pragmatic awareness. As children move from emergent to conventional literacy, they increasingly treat language as an object of thought that they can manipulate. In the process, they interact with print in different forms, including its graphic features, the alphabetic principle, spelling, and language structure. Ruddell and Ruddell (1994) describe children as actively constructing the rules of language; they are theory builders and hypothesis testers who discover various language features that allow them to switch registers in different situations. Throughout the process of language development, children adjust their hypotheses to reflect new knowledge, contexts, and experiences. These adjustments come about as they reflect on language.

In discussing development in writing, Dyson (1991) explains how, over time, children work harder to orchestrate the written language system as a whole. As they write, they try to match the meanings and graphic representations in a more precise manner, and they begin to experience the tensions that exist between intended meanings and those articulated through symbolic forms. As they try to understand the role of language in their own lives, they reflect on what they can do with their growing understanding.

As the child becomes involved in the creative process of personal meaning making and begins playing with different forms of symbolic representation, she reflects on these representations. She might invert a shape or a letter on a page, or move it to a different part of a computer screen. She might attempt to match what she is saying with what she

scribbles with a pencil or types on the keyboard. As she explores the different options available to her, she may see other ways to express her meaning. Having access to different media can be a great benefit to students and teachers in these explorations. As Dyson (1993) states, "Young children from diverse backgrounds bring diverse experiences to symbol producing -- talking, drawing, playing, storytelling, and, in our society, some kind of experience with print, all of which are resources with which both teachers and children can build new possibilities." Different children use different forms of expression, have different understandings of the relationships between letters and sounds, and use a variety of resources to solve problems as they try to figure out how written language works.

Classroom technology and metalinguistic awareness. Multimedia software, websites, and the like enable children to interact with, manipulate, and explore different aspects of language and print. When we provide time for children to explore the capabilities and features of texts using technology, they gain information about how language works (Labbo, 1996). Further, classroom technology provides a means for children to receive feedback on their efforts to construct meaning.

In a study of first graders, Dickinson (1986) found that collaborative writing placed communicative demands on children. It brought about a new form of social organization in the classroom, because it required children to talk about their writing. The computer facilitated collaborative writing by presenting legible text that was accessible to all. When the children worked together on the computer, they had to articulate their plans and they reacted to what their partners were writing. In doing so, they became more aware of what they knew implicitly and had increased opportunities to develop metalinguistic awareness. Once again, however, access to technology does not guarantee its effective use.

Word-processing software is an example of classroom technology that develops metalinguistic awareness by enabling children to transform words as they revise their writing. Dauite (1988) describes how children can become absorbed in their writing, other people's perceptions of their writing, and the forms that their ideas take on the page or the computer screen. When a child is asked to revise, he often finds it difficult to do, as once it is written, it becomes a fixed object in his mind. Revising can be complex, involving additions, deletions, and moving text from one place to another, all of which children must do while keeping in mind different elements of writing, such as the overall structure, the audience, and the use of language. Word-processing programs makes these tasks easier than they are on paper, and children may be more likely to think about their writing and revise reflectively when this technology is available to them.

Word-processing software also allows children to create print in conventional form before they can produce it by hand. Phenix and Hannan (1984) describe how a printout from a word-processing program allowed children who had difficulty with letter formation to overcome the problem of not being able to read what they had written by hand. "The value of the printout is that the copy always looks perfect to the child," the researchers state. "There is an equality here that the children normally cannot feel." Phenix and Hannan found that when the children's writing was not limited by their ability to print and spell, the

length, fluency, and literary quality of their pieces increased. As children saw more examples of correct letter formation on the screen and in their printouts, they developed increased facility in their own printing. Movement toward standard spelling was also seen.

Classroom technology can also provide the means for children to experience multisensory, nonlinear presentation of information. Many websites present pages in nonlinear fashion, inviting readers to chart their own course through the text. There has been considerable discussion about how best to approach and use this technology in the classroom. Anderson-Inman, Horney, Der-Thanq, and Lewin (1994) found that some students may not be ready to read and learn in hypertext environments. This kind of reading, they argue, requires development of traditional reading skills, computer skills, *and* special skills to navigate and read hypertext.

Similarly, Lewin (1996) outlines concerns over how children use talking picture books, software packages that essentially replicate paper books on screen, adding features such as audio narration, speech feedback, and animation. Children can choose whether to have the entire book read aloud to them, or they can select certain words to be read aloud. Some packages allow children to explore the text in many ways -- hearing music when they click on a particular part of an illustration, for example, or viewing animation when they select certain features. Lewin identified the following deficiencies with such programs:

- A child may begin to rely on the computer to decode unknown words and therefore not develop the ability to use alternate strategies
- A child may choose to have the entire book read aloud and not attempt to read him- or herself
- Interactivity can be minimal
- There is no mechanism for detecting or correcting errors if the child does not request help (as in the case of Samantha in the opening vignette)
- Talking book software does not always provide coaching in a variety of reading strategies

Once again, it is important to remember that technology is a tool that *may*, when well used, help children understand the way that written language works. Understanding how children make use of this tool in different contexts is critical. Availability of the technology on its own does not ensure reflectivity about its use.

In sum, I suggest that working in multiple sign systems through computer-based classroom technology provides children with opportunities to construct knowledge from multiple perspectives and enhances their reflection on language as they engage in the social construction of meaning. How this tool is used affects early literacy development in many ways. The next webpage focuses on the role of technology in the classroom.

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Classroom Scenarios

The children in Mrs. Logan's fifth-grade class are scattered about the classroom, sitting on the floor, at their desks, and on beanbag chairs. The teacher is standing at a chalkboard that spans one wall. Last week's project on the conflict in Kosovo covers half the board. The class is working on a unit on peace. Mrs. Logan draws a large circle and writes *Peace* in the center.

"It means no war," Jared calls out.

"You can have it in your heart," Amelia adds.

Steve says, "I don't think you can know what it means unless you were there, like in Kosovo."

"There are 59 site matches when you use *peace* as the search word at yahooligans.com," Paige says as she and Conor use a classroom computer to connect to the Internet.

"Maybe you can make a semantic map of the ways those sites describe the concept of peace," suggests Mrs. Logan. "Has anyone tried the thesaurus function on the computer? How does the online version compare to the thesaurus we have in the class library?" She writes quickly as she tries to get everyone's ideas into the circle. "Let's take five minutes for journals. Write what you think about the idea of peace. Then we'll do a journal exchange. After your exchange, please choose one or two statements that best reflect what you've discussed and post your comments on the class homepage."

The class becomes quiet. Some students whisper to one another; others are intent on what they are writing. Several students write using the computer; others use pen and paper. Cayla decides to post her comments on the class homepage immediately. She is hoping to get a response from her classmates when they have a chance to read what she posts. When it is time to share, the noise level becomes intense.

"I never really thought about how peace comes from inside you. I always think of it as something that is part of the country you live in," Eliza says to Sheila after they've exchanged their journals.

"Killing is never going to solve anything! You've got it all wrong!" Keith is angry with Patrick. "Have you ever seen those guys at the veterans' hospital? My uncle is there, and it is horrible!"

"What would you have done in Kosovo? Let all those people just die without fighting back?" Patrick argues. The boys continue trying to convince each other.

In this example, the students used the symbol systems of oral and written language to construct meaning. The computer facilitated their movement across and between sign systems. In the brainstorming session, they expressed their ideas on the topic of peace orally. They used the Internet to research different representations of peace. They used a computer-based and a paper-based thesaurus to compare word meanings. Through dialogue, a consideration of one another's ideas, and their own research, they began to construct some initial concepts of peace. Their teacher gave them a chance to reflect on these ideas independently in written form in their journals, and then to share their thoughts. Cayla chose to use a broader forum for her ideas by posting her comments on the class homepage. She wanted to use the computer to prompt dialogue with a larger audience.

After some heated discussion, Mrs. Logan begins to describe the project they will be working on over the next two weeks. "I'd like you to break into your four research groups. Each group will be working on a different way to express peace. Group 1 will be the language group. Group 2, you are the visual group. Group 3 is the music group, and Group 4 is the movement group. The goal is to create a group project that conveys something about the concept of peace using your particular symbol system. You can use any of our classroom resources, check out books from the library, or use things you might find at home. If any groups would like to join forces, that's fine with me.

"I've posted the URLs for a number of websites where you can begin your research, or you can do your own searches. Remember to think about the criteria you can use to decide whether a site is providing you with good and useful information."

Group 1: Using language to convey peace.

Group 1 began by accessing the websites that Mrs. Logan had suggested. These included first-person accounts from Kosovo at the sites of the BBC, CNN, the Canadian Broadcasting Corporation, the U.S. Public Broadcasting System and National Public Radio, and a community bulletin board run at the website of a nearby town.

Sean was flipping through an atlas he found in the class library. "This map is outdated -- is there a better one on the computer, Lisa?"

"I'm already searching," she replied.

Some students began comparing information from the different websites. "How does the CNN story compare with PBS? Whose story is getting told on those other sites? The ones from Canada and England?" Aaron wanted to know.

"I really like this site! It let's you hear this girl's voice telling her own story about what it was really like there," Kendra said. "I think we should do this project by telling a story," she added.

"Why don't we write one?" Justin suggested.

"Why don't we take a whole bunch of stories and use them?" said Andrea.

"No, wait, let's do a talk show. We'll interview people who are there," said Julie.

Group 1's final project was a talk show titled "Peace Chat," based on the stories they had read on the Internet. They used the Internet, newspapers, and books to develop background information, and then they wrote a script and presented it orally.

One student was chosen to act as the program host, and two others were the guests who were interviewed. The group generated a list of questions for the guests, based on what they had learned. They invited the whole class to participate in their show as an audience. After it was over, they asked their classmates to send them e-mail to let them know what they thought of the presentation.

In the creation of "Peace Chat," the students in Group 1 listened to and read stories from a variety of websites. They discussed what these stories meant, evaluated their sources, and argued over interpretations. They reflected on meaning, reflected on how best to present the concept of peace, and generated questions to be used in their presentation. They constructed knowledge from multiple symbolic representations of information, and they reflected on how to use language to convey what they wanted to say. Throughout, the computer was a resource

for their social construction of meaning.

Group 2: Representing peace visually.

Group 2 struggled with how to represent their ideas about peace. "I think we have the hardest one," Brianna complained.

"No way! All we have to do is find pictures so you can see peace. How hard can that be?" Stephanie said.

"What would you use?" asked Joe.

"You could use a dove, that's a symbol of peace," said Stephanie.

"How about a flag?" suggested Oladipo.

"Whose?" asked Sandy.

"Everyone's," said Oladipo, while Jennifer interrupted, "Ours!"

"That's so boring. Besides, we need to think of how to present it. Are we going to use photos, make posters, or what?" Gillian wanted to know.

"You are just talking about symbols for peace. We need to say what we mean," said Jeneel.

"How about making a webpage? That way as we keep thinking up more and more ideas, we can keep adding to it," suggested Anne.

"I like that -- we can link it to a lot of the really good peace sites we found, and it can include a lot of different ways of thinking about peace," said Seth.

"We can add different kinds of music, too," said Pete.

"And art," added Tami.

"I'll draw some designs," said Oladipo.

Group 2 decided to use their struggle to come up with how best to represent peace as the basis for their presentation. The webpage was entitled "What Does Peace Look Like Anyway?" To begin, they went to Digital Education Network's tutorial on how to use Microsoft's Front Page, West Loogootee Elementary School's page on website creation, and "Create Your Own Web Page" at Small Planet Communications for some ideas. Their final design incorporated clip art and audio files.

In the creation of their project, Group 2 students discussed the complexities of the concept of peace and decided to create a webpage to capture their ideas. They talked about what to include on the page and how best to use the medium to express what they wanted to say. They explored the different symbolic representations available to them -- clip art, music, text, graphics of all kinds, and so on. They constructed their own knowledge from multiple symbol systems and decided to let the viewers of their presentation have access to these various systems. Throughout, they reflected on the forms of language.

Groups 3 and 4: Representing peace with music and movement.

> The music group and the movement group decided to combine their efforts. "I think we can do a lot more if we try to use music and movement together," said Beth.
>
> "Don't forget about pictures!" added Tina. "I found some great photos at The American Ballet Theatre's online photo galleries that I think we should use."
>
> "I think we shouldn't just use ballet -- and, anyway, those are just pictures. I found a site that really *shows* African dance and music. It's got audio and video and everything," said Denise.
>
> "Great, but how can we combine all this stuff?" asked Matt.
>
> "What about the music?" Daniel wanted to know.
>
> "We'll find some music," Judi said.
>
> "How about some of us research dance, and the rest find some music?" said Denise.
>
> The combined groups 3 and 4 formed two new subgroups. The students who were researching music decided to focus on jazz, and they visited several websites to find background information. They found out about the styles of jazz, and they learned about jazz musicians including John Coltrane, Charlie Parker, Michael Brecker, and Sonny Rollins.
>
> After listening to a number of jazz selections online and on CDs they brought in from home, the group decided to use an audio file from a Duke Ellington site as the music for their production. They decided that it captured the feeling of peace and harmony they wanted.
>
> Tina, Beth, Denise, and Brett worked on dance steps, intent on matching them to Ellington's rhythms. "This is really hard, isn't it?" said Beth. "Trying to get music and movement to match is really frustrating."

They went to the library and found books about the history of dance, and they used the Internet to search for video of dance styles from different cultures. They tried to incorporate some of what they saw into their own patterns.

The combined group's final project was "Peace of Mind," a story told through music, images, and dance. In the final production, images were displayed as a backdrop, jazz music played softly, and the students danced. After their performance, they asked the class to write about their reactions.

In the creation of this project, the students looked at images, watched dances, and listened to music. They discussed how to find the best combination of pictures, movement, and sound to capture their ideas about peace in the sense of "peace of mind." They reflected on the different symbol systems available to them to make meaning, and how to use these systems in their production. As they thought about how to express peace without written language, they used the computer as a resource for exploring other symbolic representations to make meaning.

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Some Final Thoughts

These classroom scenarios illustrate how technology can provide opportunities for students to construct knowledge from multiple symbolic respresentations and to reflect on language and other forms of expression. There is no single answer to the question of how classroom technology can be used to support literacy learning. As we explore the possibilities, we will find out the ways that literacy development is constrained and supported for individual children in a multitude of contexts. Throughout our own explorations, we must continue to look at our students with caring and compassionate eyes that respect the different ways they will come to define themselves as readers and writers.

Perhaps the most important contribution of classroom technology is that it provides a venue for children's communicative creativity. Its greatest promise may be that it can offer children the opportunity to dance on the keyboard, to engage in a little "cyber Wanderlust" as they create their own travels on the information highway. If we want children to interact in new ways with all the media available to them, we must be prepared to travel with them. Their literacy journeys are also our own, and we must celebrate our discoveries together. Let the dance begin!

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References

Anderson-Inman, L., Horney, M., Der-Thanq, C., & Lewin, L. (1994). Hypertext literacy: Observations from the electrotext project. *Language Arts, 71,* 279-287.
Back

Bakhtin, M. (1986). *Speech genres and other late essays.* Austin, TX: University of Texas Press.
Back

Berghoff, B. (1993). Moving towards aesthetic literacy in the first grade. In D.J. Leu & C. Kinzer (Eds.), *Examining central issues in literacy research, theory, and practice: Forty-second yearbook of the National Reading Conference* (pp. 217-226) Rochester, NY: National Reading Conference.
Back

Chia, J., & Duthie, B. (1994). Computer-based art learning: Primary children's responses. *Computers Education, 23*(3), 197-209.
Back

Clay, M. (1966). *Emergent reading behavior.* Unpublished doctoral dissertation. University of Auckland, Auckland, New Zealand.
Back

Clay, M. (1967). The reading behavior of five-year-old children: A research report. *New Zealand Journal of Educational Studies, 2,* 11-31.
Back

Dauite, C. (1988). The early development of writing abilities: Two theoretical perspectives. In J.L. Hoot & S.B. Silvern (Eds.), *Writing with computers in the early grades* (pp.10-22). New York: Teachers College Press.
Back

Dickinson, D.K. (1986). Cooperation, collaboration, and a computer: Integrating a computer into a first-second grade writing program. *Research in the Teaching of English, 20*(4), 357-378.
Back

Dyson, A.H. (1989). *Multiple worlds of child writers.* New York: Teachers College Press.
Back

Dyson, A.H. (1991). Viewpoints: The word and the world -- Reconceptualizing written language development or, do rainbows mean a lot to little girls? *Research in the Teaching of English, 25*(1), 97-123.
Back

Dyson, A.H. (1993). *The social worlds of children learning to write in an urban primary school.* New York: Teachers College Press.
Back

Eco, U. (1976). *A theory of semiotics.* Bloomington, IN: Indiana University Press.
Back

Eco, U. (1990). *The limits of interpretation.* Bloomington: Indiana University Press.
Back

Eisner, E. (1978). The impoverished mind. *Educational Leadership, 36,* 615-623.
Back

Gillan, G. (1982). *From sign to symbol.* Atlantic Highlands, NJ: Humanities Press.
Back

Kinzer, C., & Leu, D.J. (1997). The challenge of change: Exploring literacy and learning in electronic environments. *Language Arts, 74,* 126-136.
Back

Labbo, L.D. (1996). A semiotic analysis of young children's symbol making in a classroom computer center. *Reading Research Quarterly, 31*(4), 356-385.
Back
Back (2nd citation)

Lewin, C. (1996). *Improving talking book software design: Emulating the supportive tutor.* Bradford, UK: Center for Information Technology in Education, The Open University.
Back

Phenix, J., & Hannan, E. (1984). Word processing in the grade one classroom. *Language Arts, 61*(8), 804-812.
Back

Peirce, C.S. (1933, 1935). *Collected papers* (vols. 3, 6; ed. P. Weiss & C. Hartshone). Cambridge, MA: Harvard University Press.
Back

Reinking, D. (1994). Reading and writing with computers. In D.J. Leu & C. Kinzer (Eds.), *Multidimensional aspects of literacy research, theory, and practice* (43rd yearbook of the National Reading Conference, pp. 17-33). Rochester, NY: National Reading Conference.
Back

Ruddell, R.B., & Ruddell, M.R. (1994). Language acquisition and literacy practices. In R.B. Ruddell, M.R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 83-103). Newark, DE: International Reading Association.
Back

Shulman, L.S., & Carey, N.B. (1984). Psychology and the limitations of individual rationality: Implications for the study of reasoning and civility. *Review of Educational Research, 54*(4), 501-524.
Back

Smith, N. (1979). Developmental origins of structural variation in symbol form. In N.R. Smith & M.B. Franklin (Eds.), *Symbolic functioning in childhood.* Hillsdale, NJ: Erlbaum.
Back

Sulzby, E. (1985). Children's emergent reading of favorite storybooks: A developmental study. *Reading Research Quarterly, 20,* 458-481.
Back

Teale, W.H. (1987). Emergent literacy: Reading and writing development in early childhood. In J.E. Readence & R.S. Baldwin (Eds.), *Research in literacy: Merging perspectives* (36th yearbook of the National Reading Conference , pp. 45-74). Rochester, NY: National Reading Conference.
Back

Tunmer, W.E., & Bowey, J.A. (1984). Metalinguistic awareness and reading acquisition. In W.E. Tumner, C. Pratt, & M.L. Herriman (Eds.), *Metalinguistic awareness in children: Theory, research and implications* (pp.144-168). Berlin: Springer.
Back

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